• COLORADO RIVER •

# AQUEDUCT NEWS

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Vol. V | OCTOBER 25, 1938 | No. 20

Ocotillo on a desert road in the vicinity of Division 3 Headquarters. Photo by Will Fox.

• COLORADO RIVER •
AQUEDUCT NEWS
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

306 West Third St.
Los Angeles, California

*Published twice monthly in the interest of Field and Office Workers on the Colorado River Aqueduct, and for the information of all other citizens of the Metropolitan Water District.*

Vol. 5 October 25, 1938 No. 20

# Plans Under Way for Aqueduct Water Treatment Plant

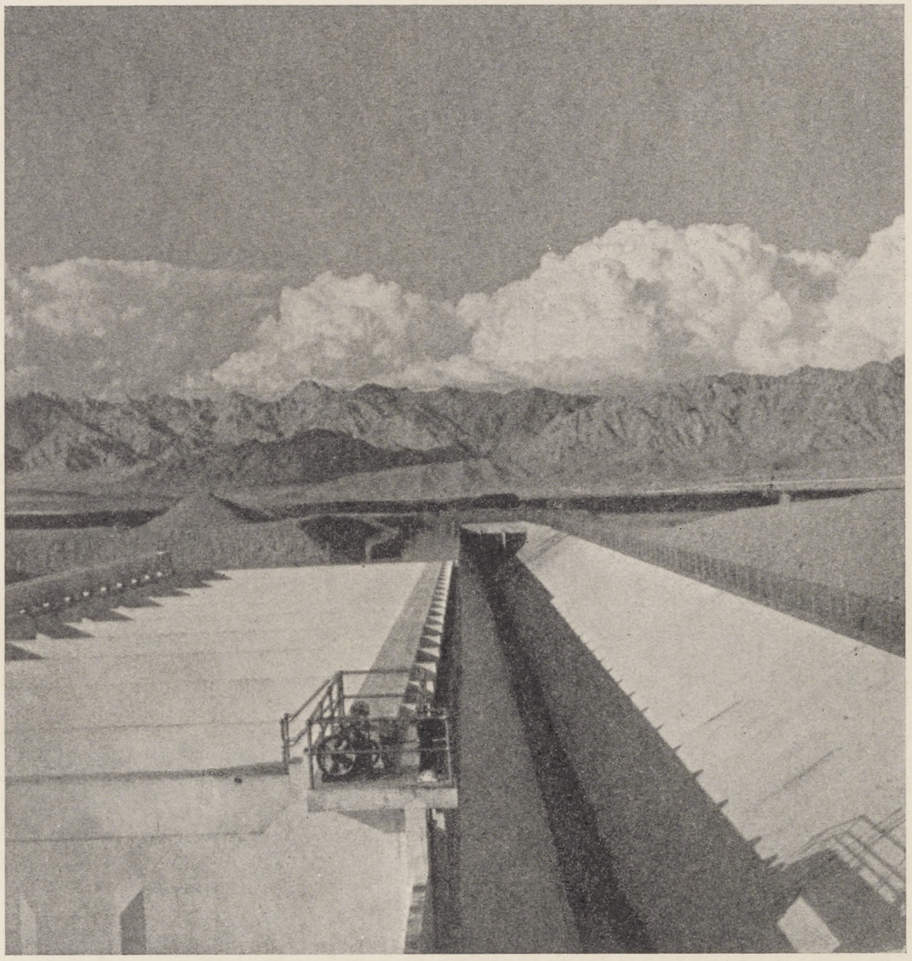
That the thirteen Metropolitan Water District cities will be served with Colorado River Aqueduct water which has been filtered and softened is now a possibility. Acting on authority granted by the District's Board of Directors at its meeting on October 21, General Manager Weymouth has already set under way the preparation of plans and specifications for a water softening and filtering plant.

Final decision concerning the actual construction of the proposed plant is to be made by the Board of Directors within the next few months.

Under the plans now being considered by the District, aqueduct water delivered to domestic and industrial consumers within the thirteen District cities will all be filtered and will be softened to a greater degree than much of the water now being used in these cities. With the exception of Beverly Hills, none of the District cities is now being served with filtered water.

District engineers point out that the treatment plant under consideration would make Colorado River Aqueduct water rank among the best water supplies in the West. The proposed plant would be located on the Upper Feeder of the Distribution system at a point from which the treated water would be delivered to each of the member cities of the District.

Pursuant to the authority granted by the Board, the District's engineering staff has already launched work on plans for the proposed plant. In addition to the District's staff, outstanding water treatment engineers will be employed as consultants to advise on the most advanced methods of filtering and softening aqueduct water.



**This interesting picture of the Eagle Mountain sand traps was taken by Ben Oliver Hicks, telephone operator at Division 3 headquarters, with a Zeiss Contax camera. The picture is an entry in the NEWS amateur photo contest.**

## – DIRECTORY –

### BOARD OF DIRECTORS

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Franklin Thomas, Vice-Chairman
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Anaheim.....E. P. Hapgood
Beverly Hills.....Arthur Taylor
Burbank.....J. L. Norwood
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Long Beach.....William M. Cook
Los Angeles.....Perry H. Greer
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Los Angeles..Louis S. Nordlinger
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Santa Ana.....S. H. Finley
Santa Monica.....Arthur P. Creel
Torrance.....Charles T. Rippy

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### GENERAL STAFF

General Manager and Chief Engineer.....F. E. Weymouth
Asst. General Manager.....J. L. Burkholder
Asst. Chief Engineer.....Julian Hinds
General Counsel.....James H. Howard
Asst. General Counsel.....Arthur A. Weber
Asst. Controller.....G. D. Smith
Chief Elec. Engineer.....J. M. Gaylord
Asst. to Gen. Mgr., Don J. Kinsey
Secy. to Gen. Mgr.....Elisabeth von Hagen

### DIVISION ENGINEERS

Distribution.....R. B. Diemer
Transmission....Robert N. Allen
Maintenance.....W. J. Neale

### SUPERINTENDENTS OF CONSTRUCTION PUMPING PLANTS

Intake and Gene.....T. T. Walsh
Iron Mt. .....B. H. Martin
Eagle Mt. and Hayfield.....R. C. Booth

### SUPERINTENDENTS

**(Main Aqueduct Tunnels)**

San Jacinto Tunnel, District Force Acct., B. C. Leadbetter, Gen. Supt.; S. J. Shrode and C. E. Sides, Tunnel Supts.; Chas. F. Thomas, Jr., Edwin Noon, Supts.; F. A. Backman, Gen. Foreman.

**(Distribution Pipe Line)**

Schedules 9P, 10P, 11P, United Concrete Pipe Corp., Roy Richards, Construction Supt.

Schedules 8C, 9C, 12C, Basich Bros., Nick Basich, Gen. Supt.

Schedules 21SC, 22SC, 23SC, J. F. Shea Co., Gilbert J. Shea, Gen. Mgr.; C. A. Shea, Jr., H. F. Rennebohm, Supts.

Schedules 24SC, 25SC, Emsco Derrick & Equipment Co.

Distribution Headworks, The Contracting Engineers Co.; Julian Huddelston, Supt.

**(Dams)**

Parker Dam, J. F. Shea Co., Frank Crowe, Gen. Supt.; H. P. Bunger, Constr. Eng., U.S.B.R.

# High Honor Paid General Manager F. E. Weymouth

In recognition of his distinguished engineering services, particularly in connection with the building of the Colorado River Aqueduct, General Manager Weymouth has been elected as an Honorary Member of the American Society of Civil Engineers.

At the present time there are only 25 living men who have been elected to Honorary Membership in this society, which was founded in 1852 and is the oldest civil engineering group in the United States.

In announcing the election of Mr. Weymouth, George T. Seabury, national secretary of the American Society, stated:

"The constitution of the society provides that 'Honorary Members shall be chosen only from persons of acknowledged eminence in some branch of engineering or the sciences related thereto'."

Mr. Weymouth has become nationally known as a result of his distinguished engineering career in connection with the building of large water supply projects. Graduating from the University of Maine in 1896, his first position was with the Metropolitan District Water Supply Commission of Massachusetts, which supplies water to the city of Boston and its surrounding metropolitan area.

**A recent picture of General Manager Weymouth, who has been elected to Honorary Membership in the American Society of Civil Engineers.**

After engineering work in Canada and Nicaragua, he entered the United States Reclamation Service in 1902. He was made chief engineer of that service in 1920, and it was under his direction, during the period 1920 to 1924, that the surveys, plans, and estimates for Boulder Dam were made.

Prior to coming to Los Angeles in 1929, Mr. Weymouth was in charge of the design and construction of many large irrigation projects for the government of Mexico. In 1929 he was made chief engineer of the newly formed Metropolitan Water District of Southern California, and was later made general manager and chief engineer of the District.

**Scene in the patio of Rancho La Brea, which provides the setting for the prologue in the District's new motion picture, "The Thirteen Golden Cities".**

## NEW DISTRICT FILM NEARS COMPLETION

Last minute details are now being completed in the making of "The Thirteen Golden Cities," the District's new motion picture, and it is expected that the film will be ready for showing in the very near future.

Telling the story of the need for water in the Metropolitan area, and how that need has been met by the building of the Colorado River Aqueduct, the new picture presents a graphic representation of this chapter in the history of Southern California. It is hoped that a theater will be obtained at which the picture will be previewed by District employees and their friends.

# CONSTRUCTION PROGRESS

October 1 to 15, 1938

## SUMMARY

| TUNNEL (MILES) | EXCAVATION Completed | EXCAVATION Remaining | LINING Completed | LINING Remaining |
|---|---|---|---|---|
| Aqueduct | 91.81 | 0.30 | 86.12 | 5.99 |
| Distribution | 16.42 | 0.25 | 16.32 | 0.31 |
| Total | 108.23 | 0.55 | 102.44 | 6.30 |

| CANAL, CONDUIT AND SIPHON (MILES) | Completed | Remaining |
|---|---|---|
| Excavation | 145.60 | 0.01 |
| Concrete | 144.42 | 0.14 |
| Backfill | 80.70 | 0.14 |

| DISTRIBUTION PIPE LINE (MILES) | Completed | Remaining |
|---|---|---|
| Excavation | 59.79 | 16.92 |
| Concrete | 59.72 | 16.99 |
| Backfill | 57.39 | 19.32 |

# TUNNELS

### AQUEDUCT

| CONTRACTOR | TUNNEL | LENGTH IN FEET | EXCAVATION IN FEET: NUMBER OF SHIFTS | AVERAGE PER SHIFT | THIS PERIOD | TOTAL TO DATE | REMAINING | LINING IN FEET: ARCH OR INVERT | NUMBER OF SHIFTS | AVERAGE PER SHIFT | THIS PERIOD | TOTAL TO DATE | REMAINING |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA | SAN JACINTO | | | | | | | | | | | | |
| | Cabazon Shaft to East Portal | 8,880 | | Completed | | 8,880 | 0 | Arch | 0 | 0 | *(62) | (37,209) | (31,634) |
| | | | | | | | | Invert | 0 | 0 | 0 | 8,484 | 396 |
| | Cabazon to Lawrence | 26,809 | | Completed | | 24,158 | | Invert | 0 | 0 | 0 | 8,484 | 396 |
| | Lawrence to Cabazon | | | Completed | | 2,651 | 0 | Arch | 0 | 0 | 0 | 6,973 | 19,836 |
| | Lawrence to Potrero | | 45 | 9.7 | 437 | 3,436 | 1,572 | Invert | 0 | 0 | 0 | 6,972 | 19,837 |
| | Potrero to Lawrence | 17,672 | 45 | 8.4 | 379 | 12,664 | | Arch | 0 | 0 | 0 | 5,802 | 11,870 |
| | | | | | | | | Invert | 2 | 155 | 309 | 8,146 | 9,526 |
| | Potrero Shaft to West Portal | 15,482 | | Completed | | 15,482 | 0 | Arch | 0 | 0 | 0 | 15,482 | 0 |
| | | | | | | | | Invert | 0 | 0 | 0 | 15,482 | 0 |
| | TOTALS Ft. | 68,843 | 90 | 9.1 | 816 | 67,271 | 1,572 | Arch | 2 | 155 | 0 | 36,741 | 32,102 |
| | Miles | (13.04) | | | (0.15) | (12.74) | (0.30) | Invert | | | 309 | 39,084 | 29,759 |

### DISTRIBUTION

*Invert considered to equal 0.2 and arch 0.8 of completed section.

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| J. F. SHEA CO., INC. | ROCKDALE (Schedule 21SC) | 262 | | | 0 | 262 | 0 | | | | 0 | 262 | 0 |
| | OAKHILL (Schedule 21SC) | 597 | | | 0 | 597 | 0 | | 1 | 57 | 57 | 597 | 0 |
| | ASCOT (Schedule 21SC) | 1,612 | 42 | 7.8 | 327 | 327 | 1,285 | | | | 0 | 0 | 1,612 |
| | TOTALS Ft. | 2,471 | 42 | 7.8 | 327 | 1,186 | 1,285 | | 1 | 57 | 57 | 859 | 1,612 |
| | Miles. | (0.47) | | | (0.06) | (0.22) | (0.25) | | | | (0.01) | (0.16) | (0.31) |

# Canal, Conduit, Siphon and Pipe Lines

### AQUEDUCT

| SCHED. NO. | CONTRACTOR | FEATURES | Length In Feet | EXCAVATION—Feet: Period | To Date | Remain'g | PIPE—Feet: Period | To Date | Remain'g | BACKFILL—Feet: Period | To Date | Remain'g |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 A & B | M. W. D.—FORCE ACCT. | Siphon | 752 | 0 | 705 | 47 | 0 | 0 | 752 | 0 | 0 | 752 |

### DISTRIBUTION PIPE LINES

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9-P | UNITED CONC. PIPE CORP. | Precast Concrete Pipe | 8,697 | 0 | 8,697 | 0 | 0 | 8,697 | 0 | 0 | 8,697 | 0 |
| 8C-9C-12C | BASICH BROTHERS | Cast-in-Place Conc. Pipe | 1,656 | 139 | 1,583 | 73 | 0 | 1,444 | 212 | 0 | 1,014 | 642 |
| 21SC | J. F. SHEA CO., Inc | Welded Steel Pipe | 26,459 | 505 | 24,122 | 2,337 | 990 | 23,947 | 2,512 | 1,500 | 15,679 | 10,780 |
| 22SC | | | 28,310 | 4,709 | 12,715 | 15,595 | 4,366 | 12,617 | 15,693 | 4,089 | 9,054 | 19,256 |
| 23SC | | | 34,358 | 0 | 34,358 | 0 | 0 | 34,358 | 0 | 0 | 34,358 | 0 |
| 24SC | EMSCO DERRICK AND EQUIPMENT COMPANY | Welded Steel Pipe | 35,950 | 0 | 0 | 35,950 | 0 | 0 | 35,950 | 0 | 0 | 30,950 |
| 25SC | | | 35,360 | 0 | 0 | 35,360 | 0 | 0 | 35,360 | 0 | 0 | 35,360 |
| | TOTALS | | 170,790 | 5,353 | 81,475 | 89,315 | 5,356 | 81,063 | 89,727 | 5,589 | 68,802 | 101,988 |

# Miscellaneous Construction

### PARKER RESERVOIR—SIX COMPANIES, INC.

| FEATURES | Est. Quan. | Period | To Date | Per Cent. |
|---|---|---|---|---|
| Diversion Tunnels—Excav. | 3,463 Ft. | 0 | 3,463 | 100 |
| Diversion Tunnels—Concrete | 3,363 Ft. | 0 | 3,363 | 100 |
| Cofferdams—Excav. | 227,582 C.Y. | 0 | 227,582 | 100 |
| Cofferdams—Fill | 464,890 C.Y. | 0 | 464,890 | 100 |
| Outlet Works—Excav. | 220,000 C.Y. | 0 | 207,787 | 100 |
| Outlet Works—Concrete | 5,000 C.Y. | 0 | 5,600 | 100 |
| Dam—Excavation | 1,502,200 C.Y. | 0 | 1,526,726 | 100 |
| Dam—Concrete | 297,900 C.Y. | 0 | 290,667 | 100 |
| Power House—Excav. | 58,000 C.Y. | 0 | 67,894 | 100 |
| Power House—Concrete | 14,000 C.Y. | 0 | 15,431 | 100 |

### AQUEDUCT PUMPING PLANTS AND APPURTENANT WORKS

| PLANT | CONTRACTOR | PER CENT COMPLETED: CONSTRUCTION | Installation of Equipment |
|---|---|---|---|
| INTAKE | WINSTON BROS. CO. & WILLIAM C. CROWELL | 100 | (Force Account) 98 |
| GENE | | 100 | 92 |
| IRON MT. | WOOD & BEVANDA | 100 | 98 |
| EAGLE MT. | L. E. DIXON CO. | 100 | 90 |
| HAYFIELD | L. E. DIXON & CASE CONST. CO. | 100 | 70 |

## Contract Awarded For Distribution Cross Feeder

At its meeting on October 14, the District's Board of Directors awarded a contract to the Emsco Derrick and Equipment Company of Los Angeles for the construction of approximately 13.5 miles of the lower end of the Palos Verdes cross feeder of the distribution system.

The total amount of the contractor's bid, which was the lowest submitted for the construction of Schedules 24SC and 25SC, was $1,091,735. The work, which is to be done under specifications No. 283, will consist of the fabrication and installation of welded steel pipe, 51 inches inside diameter, with a ½-inch centrifugally applied (spun) mortar lining and a wire-mesh reinforced exterior coating of gunite.

The new line will be an extension of the feeder now under construction between the Upper Feeder in Eagle Rock Canyon and 98th and Wadsworth Streets in Los Angeles. Extending south from 98th Street to a reservoir in the Palos Verdes Hills, the line will carry water to be delivered to Compton, Torrance, Long Beach and the Los Angeles Harbor area. Construction of the connecting laterals to these areas, and of the Palos Verdes reservoir, will be under separate specifications, bids for which are expected to be called for in the near future.

On the same date, the District Board awarded a contract to the S. Morgan Smith Company for furnishing regulating, check, and shut-off valve assemblies, and automatic pressure relief assemblies to be installed on the cross feeder south of 98th Street. The assemblies are to be furnished under specifications No. 288 with two schedules. The contract price for Schedule No. 1 is $63,148, and is $12,041 for Schedule No. 2A.

## Completion Notice Filed On Monrovia Tunnel No. 3

Construction of the last major contract tunnel on the aqueduct was finished on October 11, when the completion notice was filed on Monrovia tunnel No. 3. Built by the West Construction Co., this 32,105-foot tunnel is the longest on the distribution system. Work on this tunnel, which is a part of the Upper Feeder and runs from San Gabriel Canyon to Monrovia Canyon, was started in January, 1935.

# MONTHLY REPORT REVIEWS ACTIVITIES ALONG THE AQUEDUCT LINE

**(EDITOR'S NOTE: The following is a brief summary of some of the activities of the District as set forth in the monthly report of General Manager F. E. Weymouth, filed with the Board of Directors in October, covering work done in September.)**

### Legal Division

All necessary documents to secure the payment for Interim Certificate No. 87, in the denomination of $1,476,000, representing bonds heretofore sold to the R.F.C., were prepared. Payment for this certificate was made on September 26.

### Miscellaneous Activities Division

During the month of September, 138 employment applicants were cleared through the labor employment office for work on the aqueduct. Of this number, 69 were made available in response to requisitions for force account work, and 69 were made available for aqueduct contractors.

### Field Engineering and Construction

*Operation of Utilities*—During the period August 16 to September 15, power used amounted to 3,590,000 kw. hr.; 8,512 long distance telephone calls were handled; and 1,145,510 cubic feet of water was delivered.

*Safety Engineering*—The lost-time accident frequency record for the San Jacinto tunnel work for the month of September was 99 as compared with 111 for August and with 159 for the first nine months of 1938. The San Jacinto tunnel excavation safety flag was awarded to Lawrence for the best September record, and the concreting operations safety flag was won by East Portal.

*Aqueduct Construction*—See progress tables, page 4. Excavation in the San Jacinto tunnel was advanced 0.21 mile during September, making a total of 12.59 miles excavated and leaving 0.45 mile to be driven. The daily average working force during September was 770. Water flow in the Potrero section of the tunnel decreased 1,900 gpm during the month.

### Civil Engineering Division

*Design*—During the month contract drawings for the construction of the Palos Verdes reservoir and quantity estimates for same were practically completed. Comparative plans and estimates of cost were worked up for two locations of San Gabriel River spillway on the Upper Feeder and the writing of specifications for this work was begun.

*Specifications*—During September the following specifications were issued: No. 283, Pipe Lines, 98th St. to Palos Verdes; No. 285, Cottages, Iron Mountain, Eagle Mountain, and Hayfield; and No. 288, Regulating and shut-off valves, Palos Verdes feeder south of 98th St.

### Distribution Division

*Office Engineering*—A draft of specifications for the Palos Verdes reservoir was 75 per cent completed, and plan-profile drawings were under way for the Compton, Long Beach, and Torrance laterals.

*Field Construction* — See progress tables, page 4. Clearing of the Cajalco reservoir area was in progress. The contractor on the distribution system headworks continued concreting operations during the month. Work was in progress during the month on the San Gabriel and Monrovia Canyon crossings, and bulkheads at the ends of the Eagle Rock Canyon crossing structure were constructed and caulked, preparatory to testing.

### Electrical Engineering

*Main Pumping Plants*—See progress tables, page 4.

*Construction Utilities* — A 2300-volt line was erected to provide power for the operation of the valves at Gene dam; telephone circuits to serve the permanent camps at Gene and Iron Mountain were installed.

### Personnel Division

During the month 486 changes of status, 116 terminations, and 42 employment contracts were recorded. The total number of applicants calling for interview was 317. There were 942 inquiries received regarding employees and former employees.

### Purchasing Division

A total of 929 purchase orders was issued, covering purchases amounting to approximately $87,500. Carload forwardings during the month totaled 98, of which 54 were cement.

### Accounting and Costkeeping

The total cost of the work accomplished to September 30, 1938, was $170,978,248.

# Construction Roads

**Planning and Building the Construction Roads for the Colorado River Aqueduct**

**By CLYDE L. JENKEN**
***Engineer, M.W.D., 1931-1938***

From the Intake at the Colorado River to the 13-mile San Jacinto Tunnel, a distance of approximately 210 miles, the Colorado River Aqueduct is located in an arid and practically barren desert waste. The route passes over dry sandy valley floors which are alternated with solid rock mountain ranges that are pierced by tunnels. The climatic conditions for this entire 210 miles are typical for a desert region—the summers are long and hot and the annual rainfall is small, ranging from 2 to 4 inches.

Before construction of this portion of the aqueduct could be undertaken, it was first necessary to provide a system of roads over which construction equipment, supplies and material could be transported.

*Construction Feeder Roads*

From the Colorado River to Desert Center, only a few desert trails existed, and while it was possible to pass over them in a light automobile at a slow rate of speed with much discomfort to both driver and passengers, they were definitely inadequate for any type of loaded truck.

Between these two points approximately 110 miles of aqueduct construction had to be served.

The State Highway from Desert Center to Banning was convenient for all through traffic and was located near enough to serve as a feeder road for approximately 40 miles of aqueduct construction between Desert Center and Mecca Pass and approximately 15 miles between Garnet and Banning. A portion of this State Highway between Shavers Summit and Indio was constructed after actual construction on the aqueduct had begun. Prior to the construction of this cut-off all traffic had to be routed by the way of Mecca, which was about 10 miles greater in length. In order to expedite the construction of this new State Highway, the District participated in the cost to the extent of $20,000.

Approximately 45 miles of aqueduct construction between Mecca Pass and Garnet was too remote from the State Highway to use it for a feeder road.

To provide an adequate system of main feeder roads, it was necessary to construct 151.64 miles of new highways in addition to the new section of State Highway, about 27 miles in length, constructed between Mecca Pass and Indio.

Approximately 105 miles of these new highways extended from the Intake above Parker Dam to Desert Center; about 7.75 miles from the State Highway a few miles west of Desert Center to the Eagle Mountain pump lift; and approximately 39.2 miles from Indio to Berdoo Camp and from the junction at the mouth of Berdoo Canyon to Garnet.

From these main feeder roads many camp and construction roads of from one and two miles up to ten and fifteen miles in length were constructed by the various contractors, and in Division No. 4 by the District's own force account crews.

While these roads are in general use by the public and may ultimately become a part of the State or County highway system, they were, nevertheless, intended only for use in the construction, maintenance and operation of the aqueduct. The District's only interest therefore was to provide the most economical type of road that would serve the unusually heavy transportation needs during the construction period of five to six years, after which the roads would only be used (as far as the District's needs are concerned) for the very small amount of traffic required in the operation and maintenance of the aqueduct.

Economic studies of transportation and road maintenance costs indicated quite clearly that some sort of paved road surface would be required to withstand the heavy wheel loads, volume of traffic and other unusual abuses that would naturally accompany such a large construction program. In order to effect a minimum cost per ton-mile for the hauling of construction materials and equipment, it was of course necessary to design a system of roads that could be constructed at a low cost.

These problems were solved by the design and construction of a system of roads laid out with long tangents and few angles, which resulted in a minimum length; grading a roadbed having an over-all width of approximately 30 feet with a finished surface approximating the natural ground, but at the same time maintaining a gradient of 6 per cent or less, which produced a minimum of roadway excavation; and surfacing the roadway with an oil treated mixture known as "Oil Road Mix" for a width of 20 feet and a compacted thickness of 3 inches, which gave the road the equivalent of a paved surface at a very low cost. Many drainage structures, such as culverts and bridges, were eliminated by constructing long sweeping dips that would permit a speed of 45 miles per hour without the usual throw or bump generally associated with dips. In many places through sand the subgrade was reinforced with 6 to 10 inches of selected borrow material before the oil treated surface was placed.

The total cost of construction, including right of way, engineering and administration for the 151.64 miles of feeder roads was $912,133.11, and the total maintenance cost for the first 5 years was approximately $120,000.

## 334,000 TON-MILES CREDITED TO TRUCK AND TRAILER IN YEAR

Due to the many requests for information regarding the giant truck and trailer used by the District to haul pumps, motors and transformers for the pumping plants, B. H. Martin, superintendent of construction at the Iron Mountain plant, under whose direction the equipment is operated, has prepared the following summary:

The heavy hauling equipment consists of one 10-ton Moreland truck with a 125-hp Hercules motor and dual rear drive; one 10-ton standard trailer; and one 60-ton capacity low bed trailer (Roger Brothers), having 24 wheels and weighing 14 tons in itself and having a bed of 10-ft. x 25-ft.

Used to haul oil for the pumping plant transformers, the equipment can be converted to tankers, one tank having a capacity of 2500 gallons of oil and equipped with a gasoline driven 50-gpm pump for loading and unloading, and one 3000 gallon tank.

During the year ending September 1, the equipment traveled 30,000 miles and handled 7,150 tons, making a total of 334,000 ton-miles. The heaviest single loads were the 52-ton transformers for Gene, which were hauled from Earp siding (one per trip). The equipment has already hauled 38 railroad tank cars of oil.

Equipment for the pumping plants has been hauled from Earp to Intake and Gene, and from Rice to the Iron Mountain, Eagle Mountain, and Hayfield plants. A small amount of materials have also been hauled all the way from Los Angeles. E. H. Fields has driven the truck on all of its hauling trips.

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Mr. John H. Ramboz, representative of San Marino on the Board of Directors of the District, applied to the Board for a leave of absence for approximately 60 days during which he will make a tour of Japan as the guest of the Japanese Government.